CAPITAL PROJECT JUSTIFICATION 1991-92

JOB NO: IGS91-3 WO# 91-89200-00

TITLE: Unit 1 and 2 Burner Modifications and Replacement

DESCRIPTION: To increase burner reliability and reduce future maintenance problems, the following design changes would be implemented into all burners for Unit 1 and 2.

1. Replace 304 stainless steel components with thicker AISI 309 or 310 stainless steel components.
2. Relocate the outer register farther away from the furnace.
3. Extend the alloy tip of each nozzle to 48 inches.
4. Better support outer register plates.
5. Redesign slip seal casing.
6. Make all inner air reinforcing bars SST 304.

JUSTIFICATION: Ongoing burner failures have been directly attributed to the elevated temperatures out-of-service burners experience. Poor component design and thermal stress combine to cause repeated failures at the outer registers, slip seals, nozzles and throats. Modifying selected burner components as outlined above will mitigate future maintenance problems and increase burner reliability.

A study by Energy and Environmental Research Corporation was commissioned by IPSC. This study provided the following estimates. Annual maintenance costs on the existing burners are anticipated to be approximately $59,000. In addition, a complete change-out of certain burner parts will be required every six years.

Using: 8.6 percent cost of capital
5.0 percent O&M escalation
25 year period (burner life)

The present value of maintaining all 96 IGS burners is $11,652,548 (see Alternatives I).

The present value of modifying the burners as recommended is $3,120,000.

The **Benefit/Cost Ratio is 3.74.**

COST ESTIMATE:

	1991-92	1992-93
Material Cost (excluding OEM markup)	952,000	1,000,000
OEM markup (100 percent)		
Freight	13,000	14,000
Total Material	$965,000	$1,014,000
Engineering	70,000	10,000
Installation Labor and Equipment	484,000	508,000
Construction Overhead, Supervision, Fees	71,000	75,000
Total Installation Cost	$625,000	$593,000
Total Cost	$1,590,000	$1,607,000

ALTERNATIVES:

I. Keep existing burner design

Registers, throat sleeves and the throat sleeve casings of the existing burner design ~~will~~ need to be replaced every six years. Annual expenses to maintain the burners ~~would be~~ are approximately $59,000. The cost summary for 1 six year period (six year overhaul and interim maintenance) would be:

Material	624,000
OEM Markup	624,000
Engineering	40,000
Freight	24,000
Installation Labor & Equip.	864,000
Construction Overhead	276,480

Interim Maintenance ($59,000 x 6 years)	708,000
Job Total	$3,160,480

The present value of this alternative is $11,652,548.

II. Operate all eight pulverizers.

With all eight pulverizers in service, sufficient cooling air is provided to maintain acceptable temperatures at all burners. Boiler performance would improve with the reduction of the excess air needed to cool out-of-service burners. Coal fineness would improve with the lower feeder speeds. However, this alternative ~~would have a direct effect on the frequency of pulverizer overhauls.~~ DOES NOT ALLOW PULVERIZER OVERHAULS & IS THEREFORE NOT FEASIBLE.

~~The cost to rebuild all burners to like new condition and then operate under this option would be:~~

Material	624,000
OEM Markup	624,000
Engineering	40,000
Freight	24,000
Installation Labor & Equip.	864,000
Construction Overhead	276,480
Job Total	$2,452,480

~~The present value of this~~ alternative is $3,508,306, without allowances ~~for burner and pulverizer maintenance.~~

III. Increase cooling air

Increased cooling air would help maintain burner temperatures at an acceptable level, but would do so at the expense of boiler performance. The effect of boiler performance on plant heat rate would result in a loss of $1,831,846 per year if the amount of cooling air through

out-of-service burners is increased as required. The present value of this alternative is $42,372,216 considering maintenance costs and the loss of boiler efficiency.

SCHEDULE: Unit 1 should be completed in fiscal year 1991-92, Unit 2 in fiscal year 1992-93.

DEFERRABILITY: Not recommended. We are nearing the end of the first six year period, at which time the report recommends rebuilding all burners. The estimated cost of rebuilding the burners for one six year period is higher than the cost of resolving the problem for the economic life of the plant by modifying the burners as recommended.

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6. Make all inner air reinforcing bars SST 304.

JUSTIFICATION: Ongoing burner failures have been directly attributed to the elevated temperatures out-of-service burners experience. Poor component design and thermal stress combine to cause repeated failures at the outer registers, slip seals, nozzles and throats. Modifying selected burner components as outlined above will mitigate future maintenance problems and increase burner reliability.

A study by Energy and Environmental Research Corporation was commissioned by IPSC. This study provided the following estimates. Annual maintenance costs on the existing burners are anticipated to be approximately $59,000. In addition, a complete change-out of certain burner parts will be required every six years.

Using: 8.6 percent cost of capital
5.0 percent O&M escalation
25 year period (burner life)

The present value of maintaining all 96 IGS burners is $11,652,548 (see Alternatives I).

The present value of modifying the burners as recommended is $3,120,000.

The **Benefit/Cost Ratio is 3.74.**

COST ESTIMATE:

Material Cost (excluding OEM markup)	952,000
OEM markup (100 percent)	952,000
Freight	26,000
Total Material	$1,930,000
Engineering	80,000
Installation Labor and Equipment	968,000
Construction Overhead, Supervision, Fees	142,000
Total Installation Cost	$1,110,000
Total Cost	$3,120,000

ALTERNATIVES: I. Keep existing burner design

Registers, throat sleeves and the throat sleeve casing of the existing burner design will need to be replaced every six years. Annual expenses to maintain the burners would be approximately $59,000. The cost summary for 1 six year period (six year overhaul and interim maintenance) would be:

Material	624,000
OEM Markup	624,000
Engineering	40,000
Freight	24,000
Installation Labor & Equip.	864,000
Construction Overhead	276,480
Interim Maintenance ($59,000 x 6 years)	708,000
Job Total	$3,160,480

The present value of this alternative is $11,652,548.

II. Operate all eight pulverizers.

With all eight pulverizers in service, sufficient cooling air is provided to maintain acceptable temperatures at all burners. Boiler performance would improve with the reduction of the excess air needed to cool out-of-service burners. Coal fineness would improve with the lower feeder speeds. However, this alternative would have a direct effect on the frequency of pulverizer overhauls.

The cost to rebuild all burners to like new condition and then operate under this option would be:

Material	624,000
OEM Markup	624,000
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Freight	24,000
Installation Labor & Equip.	864,000
Construction Overhead	276,480
Job Total	$2,452,480

The present value of this alternative is $3,508,306, without allowances for burner and pulverizer maintenance.

III. Increase cooling air

Increased cooling air would help maintain burner temperatures at an acceptable level, but would do so at the expense of boiler performance. The effect of boiler performance on plant heat rate would result in a loss of $1,831,846 per year if the amount of cooling air through out-of-service burners is increased as required. The present value of this alternative is $42,372,216 considering maintenance costs and the loss of boiler efficiency.

SCHEDULE: ~~All scheduling to be controlled by LADWP.~~ Unit 1 should be completed in fiscal year 91-92, Unit 2 in fiscal year 92-93.

DEFERRABILITY: Not recommended. We are nearing the end of the first six year period, at which time the report recommends rebuilding all burners. The estimated cost of rebuilding the burners for one six year period is higher than the cost of resolving the problem for the economic life of the plant by modifying the burners as recommended.